ABSTRACT OF THE DISCLOSURE

A cylindrical roller bearing or needle roller bearing for use with a rolling raceway surface is subjected to a carbonitriding treatment to produce a layer containing 30 to 80% retained austenite in the vicinity of its surface that contacts a carburized layer of a rolling raceway surface of a roller bearing. The amount of retained austenite of the surface layer of the roller bearing is increased by about 30%. The surface layer is then heat treated to apply a residual compression stress. The surface then receives surface finishing to produce micro concavo-convex portions in a random direction.